

Central Intelligence Agency



Washington, D.C. 20505

## DIRECTORATE OF INTELLIGENCE

16 July 1984

CAAC--Expanding with Western Equipment [ ]

Summary

The General Aviation Administration of China (CAAC) operates the national airlines. It also performs functions similar to that of the Federal Aviation Administration (FAA) in the United States in that CAAC is responsible for navigational aids and airports facilities. CAAC has greatly expanded both domestic and international operations since the late 1970s, largely through the purchase of US passenger jets. We believe China will continue to look to the West for support in its expanding air sector. This process is hampered, however, by overlap in organizational responsibilities and continuing struggle among Chinese organs for the final say in aircraft purchases. [ ]

CAAC apparently is well satisfied with the performance of US aircraft and we believe the US will remain the major supplier for large to medium passenger aircraft. There also are business opportunities for ground support equipment firms as Chinese airports and air traffic control facilities are upgraded to handle more modern jets. US companies continue to supply both airport and navigational equipment but the Chinese also are approaching other foreign firms for assistance. [ ]

This memorandum was prepared by [ ] the Development Issues Branch of the China Division, Office of East Asian Analysis at the request of Crawford Brubaker, Deputy Assistant Secretary for Aerospace, Department of Commerce. [ ]

[ ] Questions and comments are welcome and may be addressed to the author [ ]

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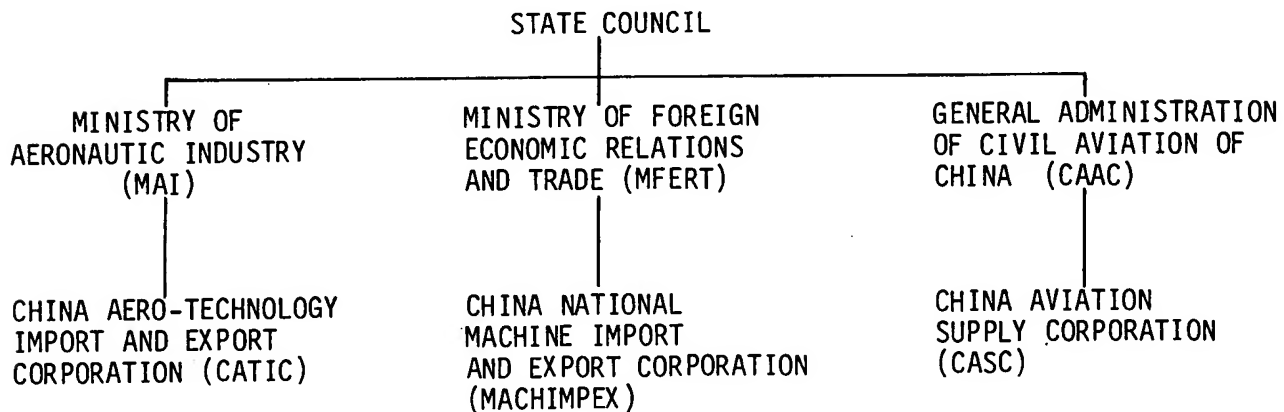
Principal Organizations in China's Civil Aviation Industry

Among the important organizations engaged in international trade and commerce involved in China's civil aviation industry, there is considerable overlap in organizational responsibilities and high potential for bureaucratic conflict. Foreign aerospace companies dealing with China have found organizations struggling among themselves and lines of responsibility unclear. For example, one company's most recent sales contract was negotiated with China Aviation Supply Corporation (CASC) where previous sales had been signed with China National Machine Import and Export Corporation (MACHIMPEX).

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Figure 1

Ministry Level Organizations and their Subsidiaries having interests in Acquisition of Civil Aviation Equipment



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MACHIMPEX is under the Ministry of Foreign Economic Relations and Trade (MFERT) and is now the chief negotiator for purchase of civil aircraft and associated equipment. The Ministry of Aeronautic Industry (MAI) controls most processes associated with the civil aircraft industry from basic research through the manufacturing stage. The China Aero-Technology Import and Export Corporation (CATIC) operating under the MIA is involved with joint ventures and offset agreements with foreign companies for production of aircraft parts and components. It also plays a role in aircraft purchases. The China Aviation Supply Corporation (CASC) acts as the purchasing agent for civil aircraft parts and equipment, navigational aids, and at times for aircraft for the General Administration of Civil Aviation of China (CAAC).

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Most recently, there have been unconfirmed reports that a group to coordinate China's civil aviation development has been established under the State Council. The new group--initially identified as the "Civil Aviation Production Leading Group"--is to reconcile the interests of MACHIMPEX, CATIC, and CASC while attempting to match and develop domestic production capabilities with end-user needs. [redacted]

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The Chinese press reports CAAC will soon face competition from several provincial-level airlines. New airline service is planned for Fujian, Guangdong, Guangxi, Shanghai, and Xinjiang provinces. [redacted]

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[redacted] Press reports indicate local officials in Fujian Province already have organized a joint venture with Hawaii-based Aloha Airlines and signed an agreement with Philippine Air Lines for flights between Manila and Xiamen where a new international class airport was completed recently. This type of decentralization could greatly increase the number of Chinese organizations negotiating for aircraft sales and services. [redacted]

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#### Organization and Structure of the General Administration of Civil Aviation of China (CAAC)

Civil aviation in China is administered by the General Administration of Civil Aviation of China (CAAC). Formerly known as the Civil Aviation Administration of China (CAAC), the organization was renamed in 1962, but CAAC was retained as the official acronym for the Chinese aircarrier. CAAC had operated as a special agency of the State Council and was charged with maintaining and operating China's civil air transport system. However, in 1980 CAAC was designated as an independent enterprise--ostensibly free from military control--with no change in its duties and responsibilities. Unlike most other world airlines, CAAC operates navigation and airport facilities in addition to its passenger, freight, and industry support flights. [redacted]

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The central authority for CAAC administration and operation is the Main Bureau, located in Beijing. The Main Bureau constitutes the decisionmaking and staff body for CAAC Director General Shen Tu and his Deputy Director Generals.<sup>2</sup> [redacted]

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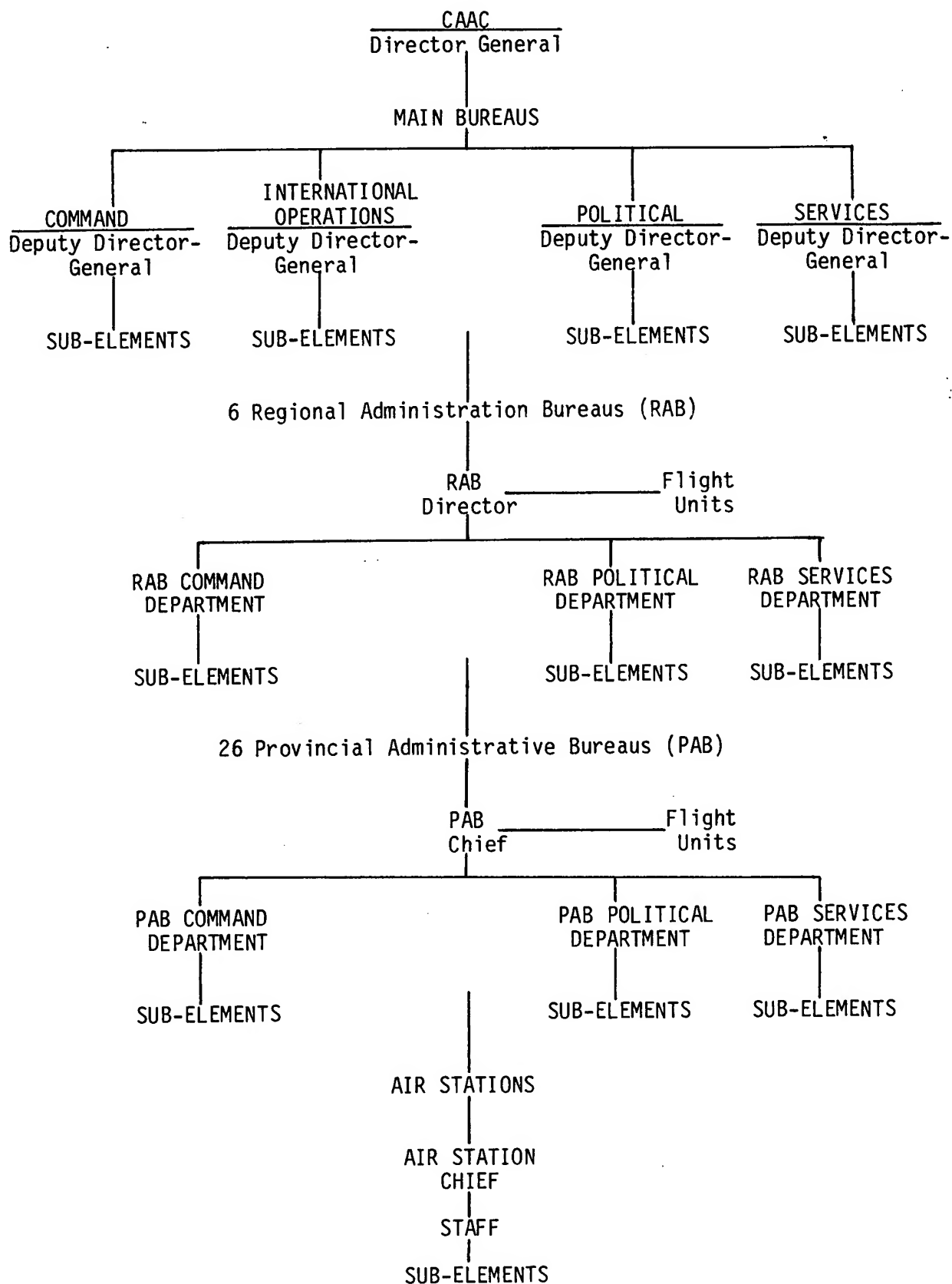
<sup>2</sup> The specific assignments of the Deputy Director Generals are unknown but Hu Yizhou, Guo Hao, Yan Shixiang, and Wang Yamin were identified as Deputy Director Generals as early as July 1983. The Deputy Director title also is used in some subelements. [redacted]

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Figure 2

# Organization of the General Administration of Civil Aviation of China (CAAC)



The Main Bureau is the top administrative level of CAAC. Four Bureaus are charged with overseeing the major functions of CAAC--titled "Command," "International Operations," "Political," and "Services"--each, in turn, has subordinate offices. The offices in charge of air traffic control, aviation, commerce, communications and navigational aids, finance and accounting, personnel, POL, supply, etc., are aligned under the four Main Bureaus and oversee the main functions of CAAC. Additionally, the China Aviation Supply Corporation (CASC) also operates at the national level and has been established as the CAAC purchasing agent in the international field for the acquisition of aircraft, spare parts, ancillary equipment and technology. [REDACTED]

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The second level of administrative control are the Regional Administration Bureaus (RAB). There are six RABs, each encompassing three to six provinces, headquartered at Beijing, Lanzhou, Guangzhou, Chengdu, Shanghai and Shenyang. Each RAB is responsible to the Main Bureau for all CAAC activity within its jurisdiction. The RAB organizations have departments and subelements that correspond to the Main Bureau elements except for the International Operations Bureau. [REDACTED]

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The third level is the Provincial Administration Bureau (PAB). The headquarters for the 26 PABs are usually located at the provincial or autonomous regional capital cities. The PAB's are subordinate to their respective RABs and structurally are carbon copies of the RABs but on a more limited scale. At those sites where the RAB and PAB are colocated, the PAB is usually only a shadow organization; that is, the PAB exists on paper but its functions are carried out by the RAB. [REDACTED]

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The fourth lowest level of administrative control is the Air Station. This is headed by the Air Station Chief who, with his staff, is responsible to the PAB. The Air Station is the first-line working level of the CAAC where day-to-day CAAC operations are carried out. Pilots, crews, dispatchers, air traffic controllers, mechanics, load masters, and other personnel are assigned at the Air Station level. The administrative and support elements that exist at the Main Bureau, RAB, and PAB levels are nonexistent at the Air Station. In their place, the Air Station Chief and a small staff handle the administrative and support functions. [REDACTED]

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#### Civil Aviation Network

During the early 1970s, China began to expand and reequip its domestic and international civil air services. Since then, CAAC has been expanding rapidly, apace with China's increased political and economic contacts with foreign countries. Until 1973, CAAC's international routes were confined to the USSR, North Korea, North Vietnam, and Burma. Since 1974, when China joined the International Civil Aviation Organization (ICAO), foreign service has been steadily increasing. China now has aviation agreements with nearly 40 countries and CAAC has

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established business connections with more than 180 airlines throughout the world. Only 15 foreign airlines, however, are serving China and most of them are being funneled into Beijing (see figure 3). CAAC, on the other hand, provides regular service to 22 cities in 18 countries, including Hong Kong.<sup>3</sup> Its service stretches from Japan across the Pacific to the United States, and from South Asia to Eastern and Western Europe and to Africa. And this September, CAAC is scheduled to begin a weekly B-747 service to Sydney, Australia that will significantly increase the length of CAAC's international routes. The total length of international and domestic routes now totals around 230,000 kilometers. Within China, approximately 170 domestic routes--up from 75 routes in 1971--cover some 100,000 km and connect around 80 cities. CAAC operates more than 670 scheduled flights a week, including flights established to accommodate the rapidly expanding number of foreign visitors.

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Figure 3

## Foreign Airlines Serving Chinese Airports

<u>Beijing Airport</u>	<u>Shanghai Airport</u>	<u>Guangzhou airport</u>
Aeroflot	Cathay Pacific Airways	none--serves as
Air France	Japan Air Lines Company	an alternate
British Airways	Northwest Orient Airlines	for some Hong
Ethiopian Airlines	Pan Am	Kong bound flights
Iran National Airlines		
Japan Air Lines Company		
Lufthansa		
Pakistan International		
Pan Am		
Philippines Airlines		
Qantas (Sep 1984)		
Thai Airways International		
Tarom-Romanian Air Transport		
Swissair		

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Airport Expansion

To support its expansion, CAAC gradually is improving airport facilities and associated services. China has about 100 airfields, most of which are small sod runways. About 35 can handle medium to large transports. The Chinese talk about a number of international class airports but Beijing and Shanghai

<sup>3</sup> CAAC serves Los Angeles, New York, and San Francisco in the US and Nagasaki, Osaka, and Tokyo in Japan. CAAC service to other countries is limited to a single city.

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are the only two now used by international carriers. Northwest Orient has approval to provide service to Guangzhou but has not yet begun service. Beijing, the largest of the international airports and the hub of the aviation network, rebuilt its terminal, enlarged one runway, and added another to support a rise in wide-body jet traffic. Beijing now handles most of the international flights--some 70 a week. Shanghai and Guangzhou airports--primarily used by foreign businessmen and tourists--although slated for expansion, have been slow in responding to growing needs. Guangzhou serves mainly as a feeder and alternate airport for Hong Kong. In the far west, Urumqi--an international class airport in Xinjiang Province that currently handles no foreign carriers--has been expanded to handle large jet aircraft. [ ]

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Additional airports for handling wide-body jets are scheduled for expansion, are under construction, or have been completed recently. The airports at Tianjin and Hefei have been upgraded to serve as alternate airports for Beijing and Shanghai, respectively. Upgrading of runways for jet traffic has been completed at Chengdu and Guilin, and new jet airports have been built at Harbin and Xiamen. Airports at Changsha, Dalian, Hohhot, Kunming, Shantou, and Wuhan are to be upgraded for larger jetliners. [ ]

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#### Air Traffic Control

Air traffic control facilities still are generally adequate for the amount of daily traffic now handled, which is less than 1 percent of the volume handled daily in the United States. However, modernized traffic control facilities are being installed at key airports to raise the utilization rate of CAAC's current inventory and to provide more sophisticated control of the larger volume of modern jets using China's airspace. At its most modern airports--Beijing, Shanghai, Guangzhou--China has installed conventional avionics and flight control equipment capable of handling current traffic volume. These airports have low-frequency, nondirectional beacons (NDB); very-high frequency omnidirectional range stations (VOR); instrument landing systems (ILS); distance measuring equipment (DME); and precision approach radars. [ ]

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Most of the large airports have a precision approach radar, but only the largest have an instrument landing system. At the smaller airports, rudimentary en route navigational aids and airport control facilities now generally limit operations during periods of darkness and bad weather. Those airports having no electronic glide slope provide VOR and NDB signals for use in standard instrument approach procedures. [ ]

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CAAC is modernizing and expanding its air traffic control system with air surveillance and computer-automated radars purchased from Western sources. French made Thomson-CSF LP-23 and TA-10 radars have been installed along the Beijing-Shanghai

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air corridor. [REDACTED]

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[REDACTED] Terminal and en route automated systems along the corridor provide tracking data such as altitude, ground speed, and identity of transponder-equipped aircraft. An automated TPX-42 supplied by the AIL Division of Eaton Corporation provides automated radar service at the Guangzhou airport. According to trade journals, the Chinese are negotiating for four more AIL systems for installation at interior airports. [REDACTED]

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CAAC just is beginning to upgrade and expand its limited air navigation network. Some 70 NDBs and about 18 VORs are the backbone of the basic air navigation system. The sparse network of VORs--some 95 percent less than the number available in the United States network--partly explains the Chinese use of five-man flight crews that include a navigator and radio operator. In many cases, VOR signals only are receivable in aircraft operating above 20,000 feet, even along major airways. Aircraft operating at lower altitudes, especially in the interior, depend on NDB equipment. [REDACTED]

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### Civil Aircraft Fleet

The Chinese penchant for multiple suppliers and earlier reliance on the USSR have given CAAC one of the world's most varied air fleets (see Table 1). CAAC had 155 aircraft in its passenger fleet in April 1984 and over 400 smaller aircraft employed in specialized aviation services. The fleet employs some 20 different types of aircraft, many of them obsolete in term of today's technology. CAAC service began with Soviet aircraft; AN-12s, AN-24s, IL-14s, IL-18s, and IL-62s still constitute a large portion of its passenger fleet. In 1970, China began looking to Western suppliers to broaden sources of equipment and to enhance the prestige of CAAC with firstline Western equipment. Up until this point, the fleet consisted mostly of piston-driven, propeller aircraft. In the early 1970s, at the same time that they purchased the Soviet IL-62s, CAAC's first long-range jet aircraft, the Chinese purchased their first medium-range British built Trident jets. By the late 1970s, the Chinese had acquired more than 30 Tridents mainly for domestic flights, and 10 long-range Boeing 707s, mainly for use on the international routes. [REDACTED]

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CAAC expansion during the 1980s has been largely with US-built passenger jets. In 1980, the Chinese acquired three long-range wide-body Boeing 747SPs in an attempt to compete with foreign airlines on a more even footing. Since then, CAAC has acquired another 747SP and a 747-200 Combi. In 1983, CAAC began purchasing shorter-range aircraft--five Boeing 737s and two McDonnell-Douglas MD-82s. Another five Boeing 737s are to be delivered by March 1986. [REDACTED]

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CAAC apparently is well satisfied with the performance of US aircraft and we believe it will continue to look to the United

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Table 1  
CAAC's Civil Aviation Fleet\*

<u>Aircraft Type</u>	<u>Inventory</u>	<u>On Order</u>
<u>Jet</u>		
American		
B-747SP	4	
B-747-200 Combi	1	
B-737-200	5	5
B-707-320B	4	
B-707-320C	6	
MD-82	2	
Cessna Citation II	3	
Gates Learjet 36A	1	
British		
Trident 2E	18	
Canadian		
CL-601/Challenger		25
Soviet		
IL-62/Classic	5	
Subtotal	<u>49</u>	<u>30</u>
<u>Propeller</u>		
American		
Beechcraft Super King 200	3	
Canadian		
DHC-6/Twin Otter	4	
Chinese		
Y-5	**	
Y-7	1	
Y-8	2	
Soviet		
AN-2/Colt	320	
AN-12/Cub	2	
AN-24/Coke	25	
LI-2/Cab	25	
IL-12/Coach	4	
IL-14/Crate	45	
IL-18V/Coot	11	
Subtotal	<u>442</u>	<u>5</u>
<u>Helicopter</u>		
American		
Bell-212	9	
Sikorsky-76	2	
French		
Alouette-3	unk	
German		
BO-105	2	
Soviet		
Mi-4/Hound	16	
Subtotal	<u>29</u>	
Total Inventory	520	On Order 40

\* Trainer aircraft are not included in inventory.

\*\* The Chinese reported producing some 700 Yun-5s that are being used for agricultural support, cargo, passengers, and aerial ambulances. We do not know how many of these 700 are actually flying under CAAC control.

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States as a major supplier for large to medium passenger aircraft. Since the last British Trident was delivered in the mid 1970s, the United States has been the sole supplier for the larger passenger jets. CAAC has told the Chinese press that about 100 long to medium-haul aircraft and another 100 smaller aircraft are needed for expanding domestic service between 1983 and 1990. According to a CASC official, CAAC shortly needs to acquire two more B-747s for the new Australian service. [REDACTED]

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[REDACTED]

In addition to passenger-cargo aircraft, the Chinese employ over 400 aircraft in specialized aviation services. Only a few US-built aircraft have been purchased for this sector. Cessna and Beechcraft aircraft are being used for flight check of navigational aids and for aerial and geological survey work. The Soviet An-2, and its Chinese copy, the Y-5--a single-engined general purpose aircraft--are used for both agricultural support and as aerial ambulances in addition to their use as small field passenger-cargo aircraft. The two newly acquired four-engine turboprop Y-8s are being used as multipurpose cargo carriers on the Lhasa-Chengdu run. [REDACTED]

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#### Traffic and Operations

Although it provides a number of specialized services, civil aviation's contribution to the total transport sector is minor when compared with rail, water, and road services. The volume of cargo is small and passengers are mostly government officials and foreign visitors. China has, nevertheless, expanded cargo and passenger volume on both domestic and international flights. Since 1975, air freight turnover has developed at an annual rate of 18.2 percent. Between 1980 and 1983, freight turnover increased at a near steady rate, averaging 17.8 percent a year--from 140 million ton-kilometers to 229 million ton-kilometers in 1983. During 1981 and 1982, passenger turnover had grown at a slightly faster rate of 22.5 percent until leveling off last year. Passenger turnover in 1983 was down around a million passenger kilometers largely as a result of domestic travel restrictions imposed after a CAAC aircraft was hijacked to South Korea. With the lifting of restrictions, passenger traffic in 1984 is expected to continue its more rapid increase. At least part of this growth in passenger transport can be attributed to the increasing number of tourists converging on China since the country was opened to tourism in 1977. Some of the freight increase is a result of China's recent entry into the field of containerized air shipments. [REDACTED]

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The present CAAC fleet is underutilized. Chinese aircraft average about two hours a day in the air; in most industrial nations the average is about 10 hours a day per plane. [REDACTED]

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[REDACTED] CAAC is beginning to make

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better use of US-built aircraft.<sup>3</sup> Management practices, as well as the small number of qualified civil aircrews, probably account for the underutilization rate rather than a poor maintenance program. [REDACTED]

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Table 2  
China: Civil Air Performance

Year	Freight turnover (million ton-kilometers)	Passenger turnover (billion passenger kilometers)
1975	60	1.5
1976	70	1.6
1977	80	1.8
1978	100	2.8
1979	120	2.5
1980	140	4.0
1981	170	5.0
1982	200	6.0
1983	229	5.9

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[REDACTED]

Complaints of difficulty in making reservations and sudden flight cancellations are the most frequent criticisms aimed at CAAC. Foreign travelers frequently encounter crowded flights with passengers occupying makeshift seats or, at the other extreme, flights that are cancelled because of too few passengers. Darkness and bad weather also produce unscheduled stopovers because CAAC plays it safe with its relatively sparse network of navigational aids. CAAC is attempting to correct both problems with modern equipment. The most recent is the introduction of computerized reservations for the busy Shanghai-Beijing route. The Shanghai-Beijing air corridor also is the only corridor with computerized radar tracking. CAAC plans to computerize reservations on other major domestic routes within the next year and, eventually, the whole system. [REDACTED]

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Although the Chinese pool of trained manpower is small, current capabilities to perform routine maintenance could support additional flight time. Scheduled overhauls on jet-powered aircraft present no problem as they are generally contracted out to foreign-based firms. For instance, scheduled overhauls for Boeing 707 aircraft have been done under contract by a Hong Kong based firm since 1973. China, however, is attempting to upgrade its engine maintenance capabilities and is actively seeking the necessary equipment and test stands. [REDACTED]

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Maintenance on the older piston-engine aircraft and turboprop aircraft is done by the Chinese in China. Chinese maintenance crews for B-747 and 737 aircraft have had some training in the United States.

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CAAC has three maintenance bases for its fleet of more than 500 aircraft. Beijing, its largest base, is responsible for maintaining the larger jets--mainly B-707, B-747, Trident, and the Soviet IL-62 aircraft. Chengdu takes care of medium-sized aircraft while Shanghai does the maintenance on the smaller aircraft. It is not clear where the new B-737s are to be maintained. They are flying routes in southeast China and there are some 737 maintenance personnel in Guangzhou.

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### The Role of Foreign Assistance

We believe that China will depend heavily on foreign aircraft suppliers for continued expansion of commercial aviation during the 1980s because its aircraft industry does not now have a jet passenger plane in serial production. However, China's aircraft industry is attempting to advance its capabilities through agreements with foreign firms, especially with US aircraft manufacturers for whom some Chinese aircraft plants are producing parts. The Chinese continue to express a preference for US-built passenger aircraft over those manufactured by other foreign firms. The Chinese also are more likely to buy from foreign firms that already are purchasing Chinese produced parts. Boeing, McDonnell Douglas, and Canadair all buy Chinese produced parts and have in turn sold aircraft.

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China has historically constructed its own airports and until recently only made limited purchases of foreign navigation equipment. The new Xiamen airport was constructed with the help of a long-term loan from Kuwait and the installation of navigational aids supplied by Northrop's Wilcox Electric Division. In addition to the ILSs, DMEs, and radars already purchased from US companies, the Chinese are looking at more US-built navigational equipment--ILS, VOR, DME, Radar, etc.--for future airport expansion. However, the Chinese also are contacting other foreign firms.

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